

**WHAT IS CLAIMED IS:**

1. A method for fabricating a liquid crystal display, comprising the steps of:  
forming a pixel electrode on a bottom substrate at each pixel area using a first  
mask such that the pixel electrode has a first region with a smooth surface, and a  
5 second region with a rough surface, the bottom substrate having a gate wire, a data  
wire and thin film transistors:

forming a common electrode on a top substrate using a second mask such that  
the common electrode has a first region with a smooth surface, and a second region  
with a rough surface, the top substrate having color filters;

10 assembling the bottom substrate and the top substrate together; and  
injecting liquid crystal between the bottom substrate and the top substrate.

2. The method of claim 1, wherein the bottom substrate is formed through  
the steps of:

forming a gate wire on a first insulating substrate, the gate wire comprising gate  
15 line, and gate electrode;

forming a gate insulating layer such that the gate insulating layer covers the  
gate wire;

forming a semiconductor pattern and a data wire on the gate insulating layer,  
the data wire comprising data line, source electrode connected to the data line while  
20 being connected to the semiconductor pattern, and drain electrode facing the source  
electrode while being connected to the semiconductor pattern;

forming a protective layer such that the protective layer covers the data wire;  
and

forming a first contact hole such that the first contact hole exposing the drain electrode.

3. The method of claim 1, wherein the first mask comprises a first region transmitting light with a first light transmissivity, and a second region transmitting the light with a second light transmissivity lower than the first transmissivity, the first region and the second region together defining the shape of the pixel electrode.

4. The method of claim 3, wherein the first region has a slit or lattice pattern.

5. The method of claim 3, wherein the first region has a semitransparent pattern, and the second region has an opaque pattern.

6. The method of claim 3, wherein each of the first region and the second region consists of a plurality of sub-regions, and the sub-regions of the first region and the second region are alternately arranged.

7. The method of claim 3, wherein the pixel electrode is formed through the steps of:

depositing a transparent conductive layer over the bottom substrate;

coating a photoresist film on the transparent conductive layer;

selectively exposing the photoresist film to light using the mask;

forming a photoresist pattern on the conductive layer through developing the light-exposed photoresist film, the photoresist pattern having a first photoresist portion placed over the first region of the pixel electrode with a first thickness, and a second

photoresist portion placed over the second region of the pixel electrode with a second thickness larger than the first thickness;

etching the transparent conductive layer using the photoresist pattern as a mask to form a shape of the pixel electrode;

5 removing the first photoresist portion while exposing the underlying transparent conductive layer;

forming the first region of the pixel electrode through treating the surface of the exposed portion of the transparent conductive layer; and

10 removing the second photoresist portion while exposing the second region of the pixel electrode.

8. The method of claim 7, wherein the surface is treated through bombarding inert gas on the exposed portion of the transparent conductive layer.

9. The method of claim 7, wherein the surface is treated through wet-etching the exposed portion of the transparent conductive layer.

15 10. The method of claim 7, wherein the first portion and the second portion of the photoresist pattern are removed through dry etching.

11. The method of claim 2, wherein the semiconductor pattern and the data wire are formed through photolithography using a photoresist pattern with portions of thickness.

20 12. The method of claim 11, wherein the photoresist pattern has a first photoresist portion placed over the data wire with a first thickness, and a second

photoresist portion placed over the source electrode and the drain electrode with a second thickness smaller than the first thickness.

13. The method of claim 12, wherein the semiconductor pattern and the data wire are formed through the steps of:

5 depositing a semiconductor layer and a conductor layer on the gate insulating layer, and forming the photoresist pattern on the conductive layer;

etching the conductive layer using the photoresist pattern as a mask while partially exposing the semiconductor layer;

10 completing a semiconductor pattern by removing the exposed portion of the semiconductor layer and the second portion of the photoresist pattern while partially exposing the conductive layer between the source and the drain electrode;

forming a data wire by removing the exposed portion of the conductive layer; and

removing the first portion of the photoresist pattern.

15 14. The method of claim 11, wherein the photoresist pattern is formed using a mask, the mask comprising a first region with a predetermined light transmissivity; a second region with a light transmissivity lower than the light transmissivity of the first region, and a third region with a light transmissivity higher than the light transmissivity of the first region.

20 15. The method of claim 2, wherein the step of forming the data wire is done after forming the semiconductor pattern on the gate insulating layer.

16. The method of claim 1, wherein the top substrate is formed through the

steps of:

forming color filters on a second insulating substrate; and

forming a common electrode such that the common electrode covers the color filters.

5           17.     The method of claim 16, wherein the common electrode is formed through the steps of:

depositing a transparent conductive layer over the top substrate such that the transparent conductive layer covers the color filters;

coating a photoresist film on the transparent conductive layer;

10           selectively exposing the photoresist film to light using the second mask;

forming a photoresist pattern on the transparent conductive layer through developing the light-exposed photoresist film; the photoresist pattern having a first portion placed over the first region of the common electrode with a first thickness, and a second portion placed over the second region of the common electrode with a second thickness larger than the first thickness;

15           etching the transparent conductive layer using the photoresist pattern as a mask;

removing the first portion of the photoresist pattern while exposing the underlying transparent conductive layer;

20           forming the first region of the common electrode through treating the surface of the exposed portion of the transparent conductive layer; and

forming the second region of the common electrode through removing the second portion of the photoresist pattern.

18. The method of claim 17, wherein the surface is treated through bombarding inert gas on the exposed portion of the transparent conductive layer.

19. The method of claim 17, wherein the surface is treated through wet-etching the exposed portion of the transparent conductive layer using a wet etching solution.

20. The method of claim 17, wherein the first portion and the second portion of the photoresist pattern are removed through dry etching.

21. A liquid crystal display, comprising:

a bottom substrate with a first region where liquid crystal molecules bear a first pretilt angle, and a second region where liquid crystal molecules bear a second pretilt angle larger than the first pretilt angle;

a top substrate corresponding to the bottom substrate with liquid crystal molecules bearing a third pretilt angle, the third pretilt angle being medium between the first pretilt angle and the second pretilt angle; and

a liquid crystal layer sandwiched between the bottom and the top substrates with liquid crystal molecules, the liquid crystal molecules being twisted at the first region in a first direction while being twisted at the second region in a second direction.

22. The liquid crystal display of claim 21, wherein the bottom substrate comprises a gate wire, a data wire crossing over the gate wire while being insulated from the gate wire, thin film transistor electrically connected to the gate wire and the data wire, and pixel electrode electrically connected to the thin film transistor, the pixel electrode bearing a first surface roughness at the first region while bearing a second

surface roughness at the second region, the second surface roughness being higher than the first surface roughness.

23. The liquid crystal display of claim 22, wherein the top substrate comprises a common electrode corresponding to the pixel electrode with a third surface roughness, and the third surface roughness is in the middle between the first surface roughness and the second surface roughness.

24. The liquid crystal display of claim 22, wherein the top substrate comprises an insulating substrate, a common electrode formed on the insulating substrate, and an alignment layer coated on the common electrode, the alignment layer having grooves such that the liquid crystal molecules bear a third pretilt angle.

25. A method of fabricating a liquid crystal display, comprising the steps of:  
forming a bottom substrate such that the bottom substrate has a first region where liquid crystal molecules bear a first pretilt angle, and a second region where liquid crystal molecules bear a second pretilt angle smaller than the first pretilt angle;

forming a top substrate such that the top substrate faces the bottom substrate with liquid crystal molecules bearing a third pretilt angle, the third pretilt angle being medium between the first pretilt angle and the second pretilt angle; and

forming a liquid crystal layer such that the liquid crystal layer is sandwiched between the bottom substrate and the top substrate with liquid crystal molecules, the liquid crystal molecules being twisted at the first region in a first direction while being twisted at the second region in a second direction.

26. The method of claim 25, wherein the bottom substrate is formed

through the steps of:

forming a gate wire, a data wire and a thin film transistor on a first insulating substrate such that the data wire crosses over the gate wire while being insulated from the gate wire, and the thin film transistors are electrically connected to the data wire;  
5 and

forming a pixel electrode such that the pixel electrode are electrically connected to the thin film transistor, each pixel electrode bearing a first surface roughness at the first region while bearing a second surface roughness at the second region, the second surface roughness being higher than the first surface roughness.

10 27. The method of claim 26, wherein the pixel electrode are formed through the steps of:

depositing a transparent conductive layer over the first substrate;

coating a photoresist film on the transparent conductive layer;

selectively exposing the photoresist film to light using a mask;

15 forming a photoresist pattern on the transparent conductive layer through developing the light-exposed photoresist film, the photoresist pattern having a first portion placed over the first region of the common electrode with a first thickness, and a second portion placed over the second region of the common electrode with a second thickness larger than the first thickness;

20 etching the transparent conductive layer using the photoresist pattern as a mask to form a shape of the pixel electrode;

removing the first portion of the photoresist pattern while exposing the underlying transparent conductive layer;



forming the first region of the pixel electrode through treating the surface of the exposed portion of the transparent conductive layer; and

forming the second region of the pixel electrode through removing the second portion of the photoresist pattern.

5           28.     The method of claim 27, wherein the surface is treated through bombarding inert gas on the exposed portion of the transparent conductive layer.

29.     The method of claim 28 wherein the surface is treated through wet-etching the exposed portion of the transparent conductive layer using a wet etching solution.

10           30.     The method of claim 25, wherein the step of forming the top substrate is made through forming a common electrode on a second insulating substrate such that the common electrode corresponding to the pixel electrode with a third surface roughness, the third surface roughness being medium between the first surface roughness and the second surface roughness.

15           31.     The method of claim 30, wherein the common electrode is formed through the steps of:

depositing a transparent conductive layer over the second substrate; and  
treating surface of the transparent conductive layer such that the transparent conductive layer bears the third surface roughness.

20           32.     The method of claim 31, wherein the surface is treated through bombarding inert gas on the exposed portion of the transparent conductive layer.

33. The method of claim 32, wherein the surface is treated through wet-etching the exposed portion of the transparent conductive layer.

34. The method of claim 25, wherein the top substrate is formed through the steps of :

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forming a common electrode over a second insulating substrate such that the common electrode corresponds the pixel electrode;

coating an alignment layer covering the common electrode; and

rubbing the alignment layer such that the liquid crystal molecules at the top substrate bear the third pretilt angle.